JULY 2007
AC1037A
AC1037A-XMIT
AC1037A-REC

DVI Video with Stereo Audio Fiber Optic Transmission System

CUSTOMER SUPPORT INFORMATION

Order toll-free in the U.S.: Call 877-877-BBOX (outside U.S. call 724-746-5500)
FREE technical support, 24 hours a day, 7 days a week: Call 724-746-5500 or fax 724-746-0746
Mailing address: Black Box Corporation, 1000 Park Drive, Lawrence, PA 15055-1018
Web site: www.blackbox.com • E-mail: info@blackbox.com

TRADEMARKS

TRADEMARKS USED IN THIS MANUAL

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FCC STATEMENT

FEDERAL COMMUNICATIONS COMMISSION AND
CANADIAN DEPARTMENT OF COMMUNICATIONS
RADIO FREQUENCY INTERFERENCE STATEMENTS

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par le ministère des Communications du Canada.

NOM STATEMENT

Normas Oficiales Mexicanas (NOM)

Electrical Safety Statement

INSTRUCCIONES DE SEGURIDAD

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.
2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.
3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.
4. Todas las instrucciones de operación y uso deben ser seguidas.
5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc.
6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.
7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.
8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.
9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.
10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.
11. El aparato eléctrico deberá ser connectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.

NOM STATEMENT (Continued)

12. Precaución debe ser tomada de tal manera que la tierra fisica y la polarización del equipo no sea eliminada.
13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.
14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.
15. En caso de existir, una antena externa deberá ser localizada lejos de las lineas de energia.
16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.
17. Cuidado debe ser tomado de tal manera que objectos liquidos no sean derramados sobre la cubierta u orificios de ventilación.
18. Servicio por personal calificado deberá ser provisto cuando:

    A: El cable de poder o el contacto ha sido dañado; u

    B: Objectos han caído o líquido ha sido derramado dentro del aparato; o

    C: El aparato ha sido expuesto a la lluvia; o

    D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o

    E: El aparato ha sido tirado o su cubierta ha sido dañada.

CE INFORMATION

Standards to which conformity is declared: EN 55103-1:1997 EN 55103-2:1997

ITEMS INCLUDED

Depending on which product you ordered, you should have received:

AC1037A-XMIT:

Qty	Description
1	AC1037A-XMIT Transmitter
1	Power Supply
1	AC line cord
1	User Manual

AC1037A-REC:

Qty	Description
1	AC1037A-REC Receiver
1	Power Supply
1	AC line cord
1	User Manual

GENERAL INFORMATION

The AC1037A is a transmitter/receiver pair that transmits a single channel of DVI video (up to WUXGA) and two audio channels over one single mode fiber.

The system's all digital encoding delivers noise-free transmissions that retain all of their initial parameters, regardless of fiber optic cable attenuation. System operation may be easily monitored using integral indicator LEDs on each unit that continuously signify the presence of baseband video and audio signals.

TECHNICAL SPECIFICATIONS

Video:

Number of Video Channels	1 single-link DVI up to 1920x1200
Video Processing	24 bits, no compression or scaling
DVI Input Loop-through	Yes
EDID (DDC) Support	Yes, from loop-through or internal
Pixel Clock Range	25 - 165 Mhz, continuous
Scanning System Supported	Progressive or Interlaced
Format Supported	RGB or YPrPb

Audio:

Number of Audio Channels	2, unbalanced
Frequency Response	+0/-0.5 dB, 20 Hz to 20 kHz
Bits-per-Sample/Sampling Rate	24 bits; >48kHz
Maximum Audio Level	+10 dBu
SNR (A-Weighted)	100 dB
THD+N	0.001%, 20 Hz - 20 kHz
Channel Phase Differential	$\pm 0.1^{o}$
Crosstalk	100 dB (1 kHz)
Input Impedance	>24 k Ohms
Output Impedance	< 1 Ohm
Audio to Video Diff. Delay (skew)	300 uSec

TECHNICAL SPECIFICATIONS (Continued)

Optical:

Operating Wavelength ..... CWDM (1300 - 1600 nm band)
Optical Fibers ..... 8-10/125 microns SM
Optical Connector ..... ST

Class I Laser Product complies with FDA performance standard for laser products, Title 21, Code of Federal Regulations, Sub-Chapter J.

Miscellaneous:

Operating Temp. Range ..... -20°C to +50°C
Operating Power ..... 9-24 Volts AC or DC@10 watts (max.)

Loss Budget and Maximum Transmission Distance:

Loss Budget (in dB) Distance* (in km) ..... 0-15 dB, 15 km

**Distance specifications are only approximate and are not guaranteed. Operating loss budget must not be exceeded.*

DANGER! The transmitting element in the AC1037A-XMIT unit contains a solid state Laser Diode located within the optical connector. This device emits invisible infrared electromagnetic radiation which can be harmful to human eyes. The radiation from this optical connector, if viewed at close range without a fiber optic cable connected to the optical connector, may be of sufficient intensity to cause instantaneous damage to the retina of the eye. Direct viewing of this radiation should be avoided at all times.

INSTALLATION

The AC1037A transmission system is ready for immediate use. There are indicator LEDs on the units for monitoring purposes. The following instructions describe the typical installation procedure and the function of the LED indicators (See Page 13).

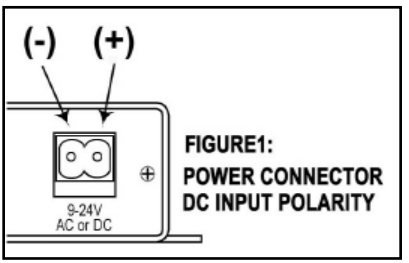

FIGURE1:
POWER CONNECTOR
DC INPUT POLARITY

1. Power off the PC and AC1037A Units.
2. Connect the DVI video source (PC) to the video input DVI-D connector on the transmitter unit.
3. Connect a monitor to the loop-thru input of transmitter unit if that is the monitor type to be used on the receiver end of the link. Ensure that the Loop/Internal EDID Switch is in the “Loop” position.

   If the loop-thru default settings are desired, ensure that the Loop/Internal EDID Switch is in the “Internal” position. No monitor connection to the transmitter box is required for this loop-thru position.
4. Connect the video output(s) on the receiver unit to the DVI-D connector(s).
5. Connect the fiber optic cable between the two AC1037A units.
6. Connect the audio input signals to the transmitter stereo jack and the audio output to the receiver stereo jack.
7. Apply power to both the AC1037A units and the PC or video source. Refer to Figure 1.
8. When power is applied, the green POWER LED will light, indicating the presence of operating power. The VIDEO LED will give an indication as described on page 13.
9. The green AUDIO LED will give an indication as stated on page 13.
10. The system should now be operational.

SYSTEM CONNECTIONS

The input and output connections for the AC1037A system is as follows:

Audio Connector (Transmitter & Receiver): 3.5mm stereo jack

Video Connector (Transmitter & Receiver): DVI-D connector

Video Pin Out:	Transmitter	Receiver
1	Red (-)	Red (-)
2	Red (+)	Red (+)
3	Red Shield	Red Shield
4	N/C	N/C
5	N/C	N/C
6	DDC CLK	DDC CLK
7	DDC Data	DDC Data
8	N/C	N/C
9	Green (-)	Green(-)
10	Green (+)	Greeen(+)
11	Green Shield	Green Shield
12	N/C	N/C
13	N/C	N/C
14	+5V Power	+5V Power
15	GND (for +5V)	GND (for +5V)
16	Hot Plug Detect	Hot Plug Detect
17	Blue (-)	Blue (-)
18	Blue (+)	Blue (+)
19	Blue Shield	Blue Shield
20	N/C	N/C
21	N/C	N/C
22	Pixel Click Shield	Pixel Click Shield
23	Pixel Click (+)	Pixel Click (+)
24	Pixel Click (-)	Pixel Click (-)

AC1037A-XMIT EDID SWITCH SETTINGS

Switch Position	EDID Information Source
Loop	From loop-thru monitor
Internal	Default Settings, Generated Internally

BANDWIDTH (BW) & EQUALIZER (EQ) SETTINGS

The AC1037A units have a Bandwidth (BW) and Equalizer Setting Dip swicth located on the front panel. The default factory settings is all switches in the off position. The default equalizer (EQ) setting is for a short DVI cable, less than 10 feet. The default Bandwidth (BW) setting is WIDE BW. This should work for most clean, “noise-free” DVI sources. A narrow bandwidth setting should be used for dirty or noisy DVI sources.

Condition	(1)	(2)	(3)	(4)
BW: Wide, EQ: Short Cable (<10 ft.)	Off	Off	Off	Off
BW: Medium, EQ: Short Cable(<10 ft.)	On	Off	Off	Off
BW: Narrow, EQ: Short Cable (<10 ft.)	Off	On	Off	Off
BW: Very Narrow, EQ: Short Cable (<10 ft.)	On	On	Off	Off
BW: Wide, EQ: Medium Cable (10-20 ft.)	Off	Off	On	Off
BW: Medium, EQ: Medium Cable (10-20 ft.)	On	Off	On	Off
BW: Narrow, EQ: Medium Cable (10-20 ft.)	Off	On	On	Off
BW: Very Narrow, EQ: Medium Cable (10-20 ft.)	On	On	On	Off
BW: Wide, EQ: Long Cable (20-30 ft.)	Off	Off	Off	On
BW: Medium, EQ: Long Cable (20-30 ft.)	On	Off	Off	On
BW: Narrow, EQ: Long Cable (20-30 ft.)	Off	On	Off	On
BW: Very Narrow, EQ: Long Cable (20-30 ft.)	On	On	Off	On
BW: Wide, EQ: Very Long Cable (30-45 ft.)	Off	Off	On	On
BW: Medium, EQ: Very Long Cable (30-45 ft.)	On	Off	On	On
BW: Narrow, EQ: Very Long Cable (30-45 ft.)	Off	On	On	On
BW: Very Narrow, EQ: Very Long Cable (30-45 ft.)	On	On	On	On

INDICATOR LED'S

The AC1037A-XMIT and AC1037A-REC units have three integral indicator LEDs that are used to monitor the state of the units. The status of the LEDs are as follows:

TRANSMITTER and RECEIVER:

Power: ON (GREEN): Indicates that correct power has been applied.

TRANSMITTER:

Video: OFF: Indicates no video detected on the input.
STEADY GREEN: Indicates DVI Video detected on the input.

Audio: OFF: Indicates no audio detected on the transmitter unit.
BLINKING GREEN: Audio detected on the transmitter unit.

RECEIVER:

Video: OFF: Indicates no video detected over the fiber and, as a result, no video present on the output.
STEADY GREEN: Indicates DVI Video detected over fiber and, as a result, video present on the output.

Audio: OFF: Indicates no audio detected over fiber and, as a result, no active audio detected by the receiver unit.
BLINKING GREEN: Audio detected over fiber and, as a result, active audio detected by the receiver unit.

OPERATING POINTERS & TROUBLESHOOTING

Optical Cable:

The AC1037A operates with most single mode (SM) optical fibers. However, be aware that the type of fiber you use will affect the system's loss budget and the maximum transmission distance that it can support.

Troubleshooting:

Multimode fiber optic cable contains an optical fiber with a light carrying "core" that is only .0025 inches (62.5 microns) in diameter. Single mode fiber optic cable has an even smaller "core," only .00032 to .0004 inches (8-10 microns). This is smaller than a human hair!

Therefore, any minute particles of dirt or dust can easily block the fiber from accepting or radiating light. To prevent this from happening, always use the provided dust caps whenever optical connectors are exposed to air. It is also a good idea to gently clean the tip of an optical connector with a lint-free cloth moistened with alcohol whenever dust is suspected.

The status of the VIDEO and AUDIO indicator LEDs should provide the first clue as to the origin of an operational failure. If these are off, it usually means that the fiber is broken or has too much attenuation. Next, be certain that the input and output signal connections are correct.

If, after reviewing the above possibilities, the system is still not operating, please contact the Customer Service Department for further assistance.

Maintenance:

The only maintenance of the AC1037A system that can be provided by the user is to ascertain that the optical connectors are free of dust or dirt that could interfere with light transmission and that electrical connections are secure and accurate. DANGER! Always disconnect the transmitter power before removing the optical fiber from the unit! For assistance with all other repairs, please contact Black Box technical support.

NOTES

P/N 126650
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